Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

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Rail Road News.

Alabama and Tennessee Railroad.

The Selma Reporter speaks very confidently of the prospects of this road. The Reporter says :

Last Tuseday the Engineers of the Alabama and Tennessee River Railroad returned to this place from a reconnoissance of the road. They went as far as Gunter's Landing, and report very favorably as to the excellence of the rout.

Mr. Troost is now on a hasty visit to Mobile and after his return two corps of Engineers will immediately enter on a survey of the route, one to start from Selma, the other somewhere about Talladega. The work may now be considered fairly under headway, and under the able management of its President, Mr. Lapsley, it will be pushed on to a speedy completion.

We are gratified to hear of the favorable prospects of this great and important work.—The Legislature has been, we are glad to perceive, quite just and liberal towards the road. The unappropriated half of the two per cent fund has been granted to the company, and in addition $100,000 of the three per cent fund.

This places a handsome sum at the disposal of the company, and if the Directors put the "right foot" forward the work will go ahead.

Railroad Movement in St. Louis.

A "Pacific Railroad Company" has been organized in St. Louis, authorized to construct a railroad from St. Louis to Jefferson City and thence to some point on the western line of the State, "with a view that the same may be continued, hereafter westwardly to the Pacific Ocean." Subscriptions to the amount of $154,-000 were made towards the road.

Mr. Neville, the English engineer, has submitted a design for a railway bridge over the Rhine at Cologne, which has met with great favor. It comprises a double line of rails, a road traffic way, and way for foot passengers on twelve piers, leaving thirteen openings of one hundred feet each.

Vermont Valley Railroad.

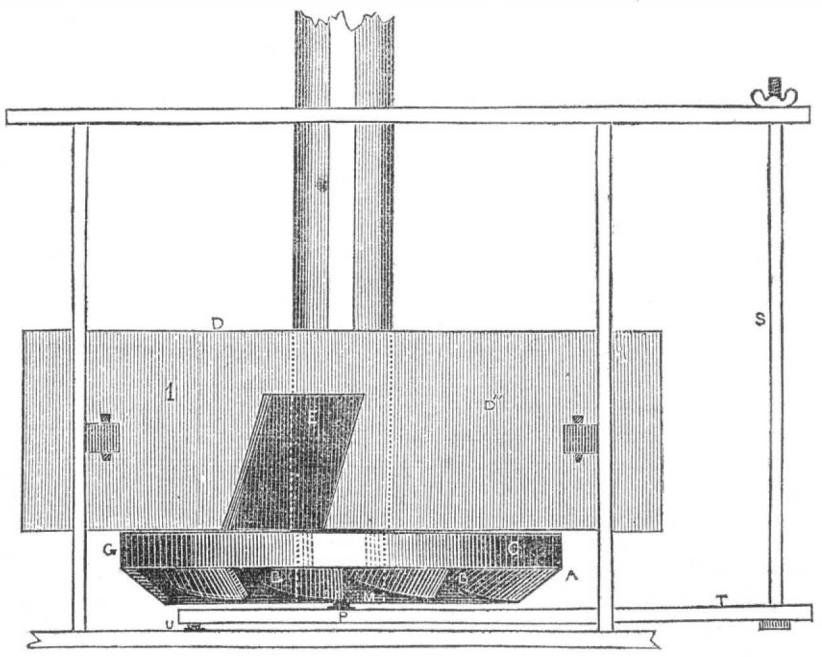
The Messrs Schuyler, of New York, have taken the contract for building the Valley Railroad between Bellows Falls and Battleboro', at $800,000 for the whole route, land damages excepted.

Relief to Travellers.

A correspondent says "The greatest trouble of the traveller coming from Philadelphia to New York is the hackmen on the North River This will soon cease. Responsible men, with sanction of the company, now enter the cars at Newark. They have a box, take the "baggage tins" of the traveller and his address, and safely deliver the trunks, bags, &c., leaving the passenger to walk home quitely. This is a great improvement.

A farmer at Bowes, Yorkshire, Eng., whose farm is on the site of an ancient Roman encampment, has recently found six large gold oval rings, weighing nineteen oz. of pure gold.

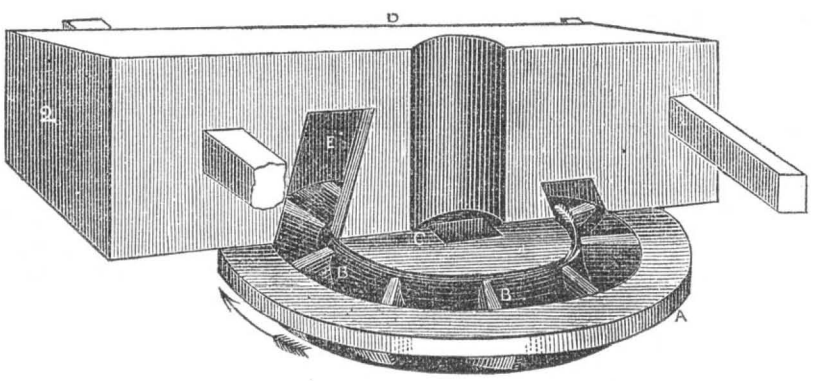
EMANUEL PARKER'S IMPROVEMENT ON WATER WHEELS.---Fig 1.



We hereby present two engravings of the improved Water Wheel, invented and patented by Mr. Emanuel Parker, of Camden, in South Carolina. This wheel has been much spoken about, and many enquiries have been made respecting its nature, qualities and mode of construction. Figure 1 is a side elevation of the wheel, showing the shaft, bridge, tree, and and part of the frame-work of the mill. Figure 2 is a perspective view, showing a section of the block and wheel combined—the larger section of the block being removed for clear demonstration. The same letters refer to like parts on both figures.

The wheel, A, is constructed in a peculiar manner, with buckets, B, and rims, C, formed of a curvature, to produce the greatest effect with the least quantity of water. With this wheel is combined a cap, D, in which is a circular tapered water-way, E, which is formed for introducing the required quantity of water to the buckets, and at the same time prevent the main body of the water in the cylinder from pressing upon the wheel. This cap is composed of two blocks of wood, D, D, which are dowelled and keyed together, and arranged above the wheel in such a manner that the wheel will revolve without touching it, and a section of it can be easily removed, to remove any obstruction that may get into it. This wheel may be made out of one circular piece of wood, or of several pieces secured well together, and well banded round the shaft, a small band (not seen) being well secured and also a larger one, G, as represented. M is a boot in the centre of the bottom of the shaft, and on the bridge tree, T, there is a pivot, P. The boot is sometimes called the *ink*. U is an axle on the bridge-tree; S is a rod to raise or lower the bridge-tree.

Figure 2.



D is the cap ; 1 and 2 are breasts through which the water enters. The cap does not touch the wheel, but makes a close joint to it. E is the water flue.

To make the buckets, two concentric circles, 8 inches apart, are described on the top of the wheel, leaving a margin of 4 inches next the periphery from the outer circle. A bevel is made up from the inner circle of 45 degrees, and from the outer one of 10 degrees, to make the face of the buckets about 7 inches, thus bringing the bevels towards one another. The buckets are then laid off (8 or 10) allowing two inches for the lap of the buckets, and a bevel guage is used to indicate their slope, commencing at 4 inches from the edge, bevelling to the bottom, until a face of 7 inches is obtained, which will be the case when finished at an angle of 45 degrees. The wheel is then turned over, and a bevel is made at the bottom with the edge next the centre *square*.—The buckets are formed or excavated, beginning in the angle of 10 degrees, working out at the edge and bottom at an angle of 45°, having an equal and regular twist in the buckets, all the way round to the ends thereof, leaving a space between the buckets of two or three inches, as may be wished, having in view the quantity of water to be used. The capacity of the buckets must be calculated to receive and let off the water, allowing one-fourth more water to be applied to the cap than the buckets can readily carry off.

The cap D is made with the timber about 6 feet long. No. 1 must be about 2 feet wide 20 inches thick at the edge next the breast, and 16 inches at the other end. No. 2 is 16 inches at the breast next No. 1, and 12 at the other, with a mortise near each end for the keys, and after they are keyed together the water flue, E, is laid off by the circle of buckets in the wheel. It is 18 inches deep when it enters No. 1, and is made at an angle of about 20°, pitching down and outwards, maintaining the same angle all round, and when it enters No. 2 it will be 13½ inches deep, and, when it enters No. 1 again it is 4½ inches deep, and it goes out at a point as near where it started as possible, so as not to cut into it. The cap may be confined down near the face of the wheel in various ways—that piece next where the water enters at No. 1, is made fast to the rests on which it lies. The other piece, No. 2, after being keyed, is held down by a small brace, so that it may be removed without much trouble, and any repairs required may also be easily made by the removal of said piece.

The claim of this patent is having buckets made in the manner described, with a circular tapered water-way or flue inclining towards the periphery of the wheel for the purpose of introducing the water to the buckets at the required angle and in quantity, and preventing the main body of the water resting upon the wheel, the core being formed like the frustrum of a cone, and the inner side of the rim sloped or inclined outwardly at the same angle as the sloped side of the cone, the periphery of the rim being vertical and the top horizontal, and the buckets between them being the sections of a screw, whose upper ends are made to incline inward on radial lines towards the core at an angle of about 10 degreees. The water-way or flue forms a segment of a circle gradually lessening in depth, from the place of entrance to where the end of the circle nearly intersects the place of beginning, the said flue inclining from a perpendicular line about 20 degrees, so as to pitch the water against the buckets at that angle, causing every bucket of the circle to be acted on simultaneously, the water escaping therefrom in a contrary direction to that at which the watsr enters, and the pressure of the ink (boot) upon its pivot, P, is removed.

This patent was issued three years ago, and from the many enquiries made respecting its merits, has resulted the publishing of the above from the specification, varying from it somewhat in language, but not in nature.

Any communication addressed (*p. p.*) to Mr. Parker, at Camden, S. C., will meet with prompt attention.

Phenomenon in Oregon.

In the Cascade mountains, in the month of last November there were heard loud reports, like distant thunder, and immediately after Silver Creek dried up for 24 hours. When the water did resume its course, it was so throughly impregnated with alkaline substances as to have the appearance of strong lye, and as also to cause the death of the fish in the stream.—About the time of the occurrence strong winds prevailed from the south, a heavy fall of ashes was noticed in most parts of this valley, and a dense cloud of smoke settled in the atmosphere, shutting out the light of the sun for nearly a week.

The Real and Ideal.

The mind of a man is like a moving picture, supplied with objects not only from contemplation on things present, but from the fruitful sources of recollection and anticipation. Memory retraces past events, and restores an ideal reality to scenes which are gone by forever.—They live again in revived imagery and we seem to hear and see with renewed emotions what we heard and saw at a former period.—Successions of such recollected cicumstances often form a series of welcome memorials.

The debt of Allegheny City, Pa., is $343,-627. It shows assets, to balance this, amounting to $338,642.

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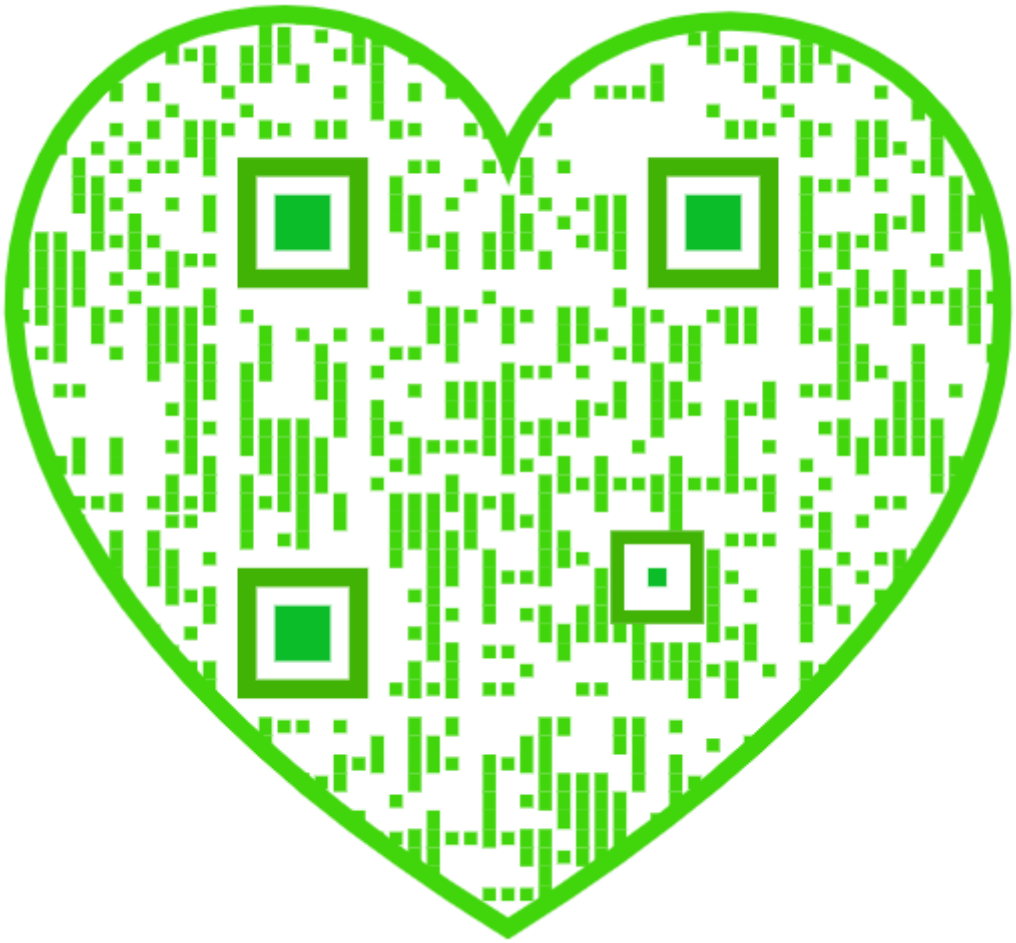

Miscellaneous.

The Pulley and the Crank.

Our readers will remember the controversial articles which appeared in our columns, respecting the merits of the Pully and the crank. The following challenge, the greatest we believe that has ever been brought before the mechanical world, has resulted from it. If this challenge is accepted, it will create more excitement than any other, not excepting the war in Hungary, which has taken place during the last ten years.

UTICA, N. Y., Jan. 28, 1850.

CHAS. GRENNEL Esq :—Dr. Sir,—I have perused your communication, published in the last No. of the "Scientific American," on the "dead power points;" and I must say that I cannot agree with you in opinion, that the crank is the *ne plus ultra* in its way, of mechanical ingenuity." On the contrary, I believe the Crank to be an inefficient and wasteful contrivance for converting the reciprocating motion of the piston into a rotary motion of the propelling shaft. With these opposite views respecting the economy and efficiency of the Crank as used in our steam engines, I propose a mode of settling the question between us in the only manner in which it can be satisfactorily demonstrated. That way is this :—To have two boats, (of about 6 or 8 tons each) of the same size and exactly alike, with paddle wheels and boilers of exactly the same size for each boat, and precisely alike. Then two engines, (of 6 or 8-horse power, each); one for each boat, with cylinders of the same diameter, and every other part of the engines of the same size and precisely alike, except that one shall be the common and usual crank engine, new and good and perfect in all its working parts; and the other engine have no crank, but a pulley or pulleys instead thereof. That then you, or some friend for you, to have the exclusive and sole management of the boat with the crank engine, and myself, or some friend for me, of the other boat and engine,—and both boats to run in the same water, at the same time, and with the same equal pressure and quantity of steam. That boat which in running 8 miles, with the same pressure and quantity of steam, shall be ahead, to be regarded as having the most economical and efficient engine. I have had two such boats and engines built during the last season in New York, at a cost of over $4,000. I have heretofore endeavored to convince you and others by argument, through the columns of the papers of the day, that the crank is a "bungling inefficient and wasteful contrivance," and failed to produce conviction. I am compelled now to resort to another argument—the argument of fools, it is said—to produce conviction.

I will bet both boats, boilers and engines, against $2,000, (less than half they cost me,) that the boat having the pulley engine, and no crank at all, will beat the boat with the crank engine, a mile in eight—that is, run 9 miles to the latter eight—with the same pressure and equal quantity of steam, and the boats (including draft and displacement of water) boilers, paddle wheels, &c., precisely alike, and the cylinders the same bore. The pulley engine winning that bet, I will give you the option to repeat the bet, upon the gain of a mile in 7. Then a mile in 6; then a mile in 5, and so on until the crank wins a bet. After the second bet won by the pulley, I will, if desired, upon the expense thereof being paid, shift the engines—placing the pulley engine upon the crank boat, and vice versa; and will also, from the start, and at all times, give full permission to increase or diminish the size of the paddle wheels of the crank engine boat—and alter the engine (being responsible to me for real damage only to the engine) in any manner you please, or to substitute an entire new engine, at your own expense, (keeping the bore of the cylinder the same) to suit yourself. Can anything be more fair? If the crank engine loses nothing, as you think, then, surely, the Pulley engine can gain nothing; much less a mile in 8. If you are not disposed to "back" your opinion in this way, (you must see from the character of my proposition that it is public conviction, and not the money alone or chiefly I seek). You have my consent to communicate this offer to any and every person whom you think may be inclined to accept it. The time and place for the trial to be the first Monday of May next, at New York. If you, or any friend of yours, desire to accept this offer, please address me here, (Utica, N. Y.,) accordingly without delay, and forward this letter with an endorsement on the back thereof —Offer accepted, and signed with your name, together with the money to some friend of yours in New York, to meet a friend of mine at the office of Hon. Horace Greeley, of the Tribune, on the first Monday of April next, at 11 A. M., to deposit this offer and your acceptance, and the money, and my Bill of Sale to you of the boats, boilers and engines, with him as stake-holder. Or, if you prefer E. K. Collins, Esq., Agent of the Ocean Steam Navigation Co., New York.

For your gratification, or information, I would state that I reside at Milwaukie, Wis.; and that I am neither an Engine-builder, engineer, or mechanic, but a lawyer by profession, and Inventor of the "Pulley Engine."

Very respectfully, &c.,
PETER YATES, (Pulley).

MARION, Perry Co., Alabama,
February 8, 1850.

PETER YATES, Esq.—Dr. Sir,—Your communication of the 28th ult. came to hand by yesterday's mail. In answer to which, permit me to say that I have no objections to "back" my opinions in the manner proposed by you, if no other than a "fool's argument" will suffice to convince you of your error. But being the challenged party, I certainly have the right to choose my own ground, as well as suggest the manner in which the subject at issue shall be "satisfactorily demonstrated." My objection to the arrangements proposed by you, are these: First. Your boats have been constructed under your exclusive direction and supervision, solely it appears, for experimental purposes—for which, as well as for practical ends, they are entirely too small, and the data to be elicited from an experiment with them, could not safely be relied upon as a foundation for any great practical results. Every man of science is aware that there are many machines which work well in model, that are entirely inapplicable to purposes of practical utility; thus successfully illustrating that man's skill is limited, even in the application of the simple laws of mechanics. And again, if I were to win your boats, they would be of no practical use to me whatever, and I doubt very much if I could sell them in New York, for even one-fourth of their original cost.

Now, that a contest of this nature may result in some pecuniary benefit to the successful party, as well as practically illustrate to the scientific world, the comparative merits of Cranks and Pulleys, I most respectfully ask leave to suggest the following proposition, viz: That we deposit in the hands of Messrs. Munn & Co., of the Scientific American, the sum of $30,000 each, authorizing and empowering the said Munn & Co. to contract for, and superintend the building of two large boats, suitable for the conveyance of passengers and freight, adapted to the Lake trade between Mobile and New Orleans. That they be built to the same model, precisely, and furnished with low pressure engines, perfectly alike in every respect, save the Crank and Pulley connections of the piston with the shaft. That they be freighted at New York with two-thirds at least of their entire tonnage, and working under a pressure of steam not to exceed a given quantity, to run at some future day from New York to Mobile. The fixing of said day, the amount of pressure of steam to be applied, &c., &c., including all other preliminaries, to be arranged and decided upon by said Munn & Co. On the arrival of the boats at Mobile, the said Munn & Co. their Agent, or attorney, to transfer to the successful party the sole and exclusive right in and to said boats, their engines, and appurtenances.

Thus will the question have been satisfactorily, as well as practically demonstrated. The boats on their arrival at Mobile, will then be in a situation where they can be used to great pecuniary advantage, in plying between the two cities above mentioned, or be sold, if desired for cash, for more than one-third advance on their original cost. The freight and passage money from New York, would enable the successful party, after paying insurance and other incidental expenses, fully to remunerate the said Munn & Co. their agents, or attorneys, for their services in the premises. The faithful performance of which last condition, I insist shall constitute a preliminary arrangement of the contest. You will therefore, be pleased, upon the reception of this, (a copy of which, with your letter, I have this day forwarded to Messrs. Munn & Co., trusting in their co-operation,) to deposite in the hands of the above named gentlemen the sum of $30,000, together with a power of attorney directed to them, embracing in full, and in every particular, the above conditions. Whereupon the said Munn & Co. are requested to notify me forthwith of the fact, when I will likewise comply by forwarding my check immediately, accompanied with a like power of attorney. All further preliminaries, conditions, and arrangements to be submitted to the sole control and management of said Munn & Co. I respectfully ask leave however, to suggest, that the following arrangements be included, viz :—The said boats to be named and called after their respective engines—The Crank. and The Pulley. That you shall be the Commander or Director of the Pulley, and that I shall be the Commander or Director of the Crank. That upon the Pulley shall be deposited an extra crank, and on the Crank shall be deposited an extra pulley. That in the event the Pulley should get behind, and be in danger of swamping, that I shall have the privilege of insisting upon the attachment of the crank. And in the event the Crank should get behind, and be in a similar predicament, then you shall have the privilege of insisting upon the attachment of the pulley. And in order, the better to carry out those arrangements, I further propose: That upon the departure of said boats from New York, six disinterested persons shall be selected from the passengers of said boats, i. e. 3 from those of the Crank, and 3 from those of the Pulley, who shall be sworn to act impartially, and be fully authorized that in the event either boat shall be left so far behind in the race, as to lose sight of the other, to declare the contest in favor of the foremost boat.—Whereupon the successful boat shall have the power to return to her companion in distress, and the committees aforesaid proceed to attach the crank, or the pulley, as the case may be. This arrangement I consider of vast importance, since, on the safe delivery of both boats at Mobile, will depend the beauty and interest of the adventure.

If you decline acceding to the propositions herein set forth, or fail to comply therewith, within 15 days from the reception hereof, then you shall be considered as having "backed-out" and fully conceded the point at issue.

And now permit me in conclusion to assure you, that it will be useless to multiply words, or propose other conditions for settling this matter, than those herein suggested. I will consent to no other. The results of such an experiment would be final and conclusive, of some interest to ourselves pecuniarily, and to the world scientifically. The ocean has now become the great theatre for the exploits of steam. Let the test be made upon its waters, or not at all. It is the only field upon which great and important improvements in steam navigation, can be successfully introduced to the world. Establish the supremacy of the Pulley over the Crank on that field, and your fortune and fame are secure, otherwise you are destined to the shades of an impenetrable oblivion. In return for the information relative to yourself, I will state that I am neither an Engine-builder, Engineer, Mechanic, or Lawyer, but an amateur of the arts and sciences, generally, and one of the editors of the "Alabama Commonwealth," the first No. of which will not appear till the 1st of next month, and is therefore as little known as your "Pulley Engine."

Very Respectfully &c.
CHARLES GRENNELL.

Celtiberian Relics.

The French papers report a discovery in Ormoy, in the department of the Oise, of interest to the antiquary. A piece of ground covered with large stones—apparently the remains of a mound or altar—was recently purchased by a M. Renard, who commenced the removal of the stones. One of the largest he was obliged to blow up with gunpowder; when the entrance to a solidly constructed vault was laid open, and within two skeletons were found dressed from head to foot in bronze armour—with conical helmet and round buckler ornamented in the centre with a knob incrusted in gold, and wearing belts ornamented with silver plates. The quivers and lances were in bronze, like the armor. Near the stone which served as pillows to the heads of the skeletons were found six large vases of black earth, decorated with curious mythological figures (but what system of mythology they belong to, we have not seen stated) painted in white and sky blue. The largest of these vases is about 18 inches in height; the smallest contained a thin gold leaf, on which were traced about 150 small characters that are said to resemble the inscriptions found on the Celtiberian medals—which is natural enough. The inner walls of the vault were covered with traces of paintings —such as are still seen in Egyptian tombs—of a banquet, and of warriors, both horse and foot. On the roof has been painted the sun's disc, adorned with wings. These interesting relics, it is said will be presented to the Museums of Paris and Amiens.

Counterfeit Detector.

Our readers will notice in another column the advertisement of H. C. Foote's Universal Counterfeit Bank Note Detector. We have examined the system and have no hesitation in stating that it will do more than all others now in use, towards ridding the country of counterfeit notes. The instructions which accompany the magnifying glass, will enable a person with very little trouble, to determine between good and bad notes. We notice among those who have recommended the system, the names of F. W. Edmonds, Esq., Cashier of the Mechanics Bank, N. Y.; E. H. Arthur, Esq., of the Union Bank; C. S. Sloan, Broker, Wall street, and many other prominent money dealers. From what we can learn we should think it a subject of universal interest.

Paine's Light.

Persons applying to us for information regarding Mr. Paine's Electric Light, will please bear in mind that, as soon as the inventor is ready to reveal its nature to the world, it will be sure to find a place in the Scientific American.

We are daily receiving newspapers with "please exchange" marked upon them. We should gladly accommodate all our contemporaries in this way, but our exchange list is already larger than we care to have it, and new applications must be disregarded, unless the publishers insert our prospectus. All newspapers containing this prospectus will be entitled to the Scientific American, through this Volume, without sending their paper, and we should be sorry to know that we had overlooked any in this respect.

Miss Mary Pace, aged 12 years, a scholar in the M. E. Sabbath School in Corning, recited, from memory, a few Sundays since 4,000 verses from the New Testament—all of which she committed to memory in one week.

[The above is from a religious exchange.—It must have made a mistake in one 0. But 400 verses are too much for a child to learn in one week. We belive it to be sinful to strain the memory of the young.

The attendence, in the schools in the city of New York, is larger this year than ever before, and an excellent spirit prevails among persons interested in promoting the causes of education.

It is said that the speed of swallows, when emigrating, is not lees than fifty miles an hour; so that when aided by the wind, they soon reach warmer latitudes. It has also been calculated that the swallow can fly at the rate of ninety-two miles an hour, and that of hawks and several other tribes to be one hundred and fifty miles an hour.

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Chinese Printing.

The following article from Munsell's Typographical Miscellany, will be read withmuch interest :—

The Chinese claim a very high antiquity for their art of printing. Even in the reigon of Wu-Wang, who lived about 1100 years before Christ, they are said to have been well acquainted with it. The Japanese, however, claim the merit of the invention. In Thibet, also, the art of printing was practiced at a very remote date. The pretensions of these nations to so early an invention of their rude art, has led many learned commentators to treat their claims with very little respect, and to fix a more recent period for its introduction. But it does not seem, upon reflection, to be so very marvellous that any nation, however rude, should have hit upon a process of printing at any period. On the contrary, it is matter of wonder that the Egyptians, the Grecians, and the Romans, with all their wisdom, and all their necessities for such an art, should have remained ignorant of it. It had been the custom for thousands of years to make impression with seals upon wax, yet no active mind grasped the hint, that a mighty art awaited the touch of genius to spring into being. Who can concieve what would have been the state of the world in our day, had those nations possessed the art of printing!

The mode pursued by the Chinese in their practice of the art of printing is thus described by the author of Sketches of China. It may be thought very rude; but when it is considered that every character in their language is a word, it will be seen that the introduction of separate types would be attended with small advantage.

"The means in use among the Chinese for producing an impression of letters appears to be nearly the same with those invented in the infancy of the art. Blocks of hard wood, or masses of metal forming a kind of stereotype, are printed from, by a simple and expeditious process, and solely by manual labor, as presses for the purpose are entirely unknown.—The Canton Gazette, a kind of court journal of appointments, arrivals, and departures, is one of the few publications which are printed from moveable types. The blocks which are mostly used for engraving these stereotypes upon, are made of hard and well seasoned wood, divided into slabs, in the direction of the grain. The subject to be engraved is carefully written or drawn on thin paper, and pasted reversed upon the board; the wood is then cut from around the characters, and the letters remain in low relief. Much care is used in adjusting the written pattern, as it is not possible to rectify a mistake on copper or other metal.—The cost of engraving depends entirely on the size and delicacy of the letters, the price increasing in proportion to the smallness of the type. The equipments of a printer are very simple and cheap, and the operations less complicated than almost any other mechanical process. The board or slab of wood is placed on a table before the workman, and a pile of dry paper, cut to the proper size, at his side, when, with a rude bamboo brush, a coating of liquid Indian ink is put upon it; a sheet of paper is then placed on the top, and the impression completed by rubbing it over once or twice with a kind of vegetable fibre; the sheet is then lifted off, and the process repeated with the next. The paper used is very thin, and is only printed on one side, the sheet is folded with the blank sides, in contact, and the edges are bound into the back of the book, making it resemble a volume, the leaves of which are uncut; the paging &c., is on the external margin. In this simple manner, all the books and engravings on wood are printed, and a skillful workman is able to produce the impressions with as much celerity as our own, with the use of the press. Works of minor consequence are generally executed in a flimsy and imperfect manner, the printing of some being very indifferent at first and nearly unintelligible by the time a full edition has been taken off. The price of books is low, and there are numerous book shops and stalls in all the principal streets. The binding is very different from our own, the covering being merely soft paper, and the title carefully written on the bottom leaves. Five or six volumes are enclosed in a paste board case, and the books arranged on shelves, so as to present the titles to the front. Spurious editions are said to be very common, and I have never discovered that there was any protection of the copyright by law; consequently numerous incomplete copies of the orginal are circulated. Works are sometimes met with, the letters of which are white, on a black ground, the character being cut, as in a copperplate engraving, below the surface. There are in most cases, specimens of the various kinds of writing, intended as copies to write from, as well as some school books."

Among a collection of Bibles which we have made in about twenty languages, is one in Chinese in 4 vols.

The Hand-Loom Weaver and The Power Loom.

More than a hundred years before the invention of the steam-loom in the Philosophical Transaction for August, 1678, there was given some account of "a new engine to make woollen cloths without the help of an artificer,"—being a communication from a M. de Gennes, "an officer belonging to the sea." Much ingenuity is exhibited in the mechanical construction of this "engine," considering the time it was produced; but in those days the only method of passing the wool thread through the warp, was by the finger of the weaver, assisted occasionally by a notched stick. And accordingly, M. de Gennes, or whoever was the inventor of the machine, could hit upon no better plan than the complicated imitation of the human hand and arm by which his shuttle is carried from side to side. Long afterwards, a common weaver invented the "fly shuttle," which is shot to and fro by springs, and modern inventors having the benefit of this capital discovery, started from high vantage ground, and have succeeded in bringing the power-loom to its present state of excellence. But the difficulty with which a novel idea is caught or worked is not the only one which stands in the way of an inventor. Improve our mechanism as we may, the human operator will always form an important element in our combinations, and will often prove by far the most intractable of our materials. Once let the workmen be inured to the routine performance of duties on one machine, and it becomes a work of much time and cost to transfer him to another. The dearly acquired skill which constituted his chief capital is rendered useless; and the apprenticeship to his new tasks must be completed at much labor to himself and expense to his employers. We are assured by high authority that little short of a whole generation must expire before the change can be thoroughly established.—When some of the more remarkable inventions, like those of Arkwright's spinning-jenny, were first introduced, it was found necessary to discard the whole of the trained operatives, and to entrust the attendance upon the new machines, either to young children, or to recruits drawn from rustic neighborhoods, who had never touched a spindle. It was no wonder that the "skilled laborer" of the old system denounced and resisted the new; just as the old English archer resisted the introduction of the musket, after having acquired by incessant practice from earliest childhood—his unerring skill as a marksman, and so great muscular power that he could be recognised a mile off, merely from the size of his arms. The spinning-jenny, indeed, presented such an enormous increase in speed and economy, that the old workers gave in without a struggle. But the weaving machines did not appear at first so hopelessly superior. The hand-loom weavers found themselves able to "live in the race" with the steam engine, although at a terrible sacrifice. The competition has been persevered in, with melancholy pertinacity to the present day; until society has the burden and the scandal of a numerous class of individuals, industrious but ill-judging, who have, even in good times, to battle for a bare subsistence against fearful odds; and who, in the frequently recurring periods of depression, present the most afflicting spectacle.

In this country the only field for the hand-loom weaver seems to be "the weaving of rag carpets"—in the city of New York there are a great number employed on their own account. Their shops are all in cellars, and they are chiefly Scotchmen, and Irishmen from Ulster. They seem to belong to another age, and when they depart their looms will be silent forever.

Newly Discovered Properties of Heat In Combination with Steam.

Our readers will remember that we published (some time ago) the report of Prof. Horsford, Cambridge College, Mass., upon a pamplet submitted to the Rumford Committee of the University, the said pamphlet being the production of Mr. James Frost, Brooklyn, N. Y., describing a new discovery made by him, whereby all the old theories on steam were overturned. We now present some facts in relation to the same, to explain the nature of his discovery. These are taken from his pamphlet. The principle of the discovery is this :—It has been held to be a fact that steam to be expanded to double its volume, required 480 extra degrees of heat, and he has discovered that it only requires 4 extra degrees of heat, when heated out of contact with water, and the rate of expansion doubles in volume by an addition of a root of heat, that is, if 4 degrees double the first volume, it requires only 2 to double the second, and this new property of steam and heat he denominates "*Stame.*"

The present diagram represents a bent glass tube, sealed at the shorter end, a very small drop of water having been first introduced into the shorter sealed end thereof, that end was filled with mercury. This eudiometer having a wooden handle, a cork float and index wire, covered with thread introduced therein, was prepared for experiment

The shorter end of the eudiometer was immersed in a vessel of cold water, the vessel placed over a fire, and when the water boiled, small quantities of common salt were added at intervals, while the water was boiling, and until it was saturated and maintained the stationary heat of 228° for a few minutes, whereby the greater part of water being superfluous, was expelled with the mercury from the shorter to the longer end of tube without disturbance, and and a full volume of pure steam, rarified and expanded by the heat of 228° was retained in and filled the shorter end of tube, while the greatest height of the index wire was marked on the wooden handle.

To estimate rightly the actual extent and value of the expansion of a definite volume of steam in this eudiometer, it becomes necessary, first, to define, obtain and fix upon some well known and definite unit of steam, and a volume of steam will be formed under atmospheric pressure and temperature 212°, which will faithfully represent a full and definite unit volume of atmospheric steam in the eudiometer,—provided, that at the time of observation, the surface of the mercury in the shorter end of tube stands on a level with the mercury in the longer end of tube, both ends being immersed at the time in boiling water. This adjustment may be very conveniently and accurately obtained by employing a double boiler or Balneum Maria, the outer vessel of glass connected to a metallic bottom. Such a glass cylinder should be of much less diameter, but of twice the height of the outer metallic vessel, and filled with water, which will be maintained at the boiling temperature of 212°, by the greater heat of the saline solution at 228° in the outer vessel.

For in this transparent boiler and liquid, the quantity of mercury in the respective ends of the tube may be seen, the instrument may be withdrawn therefrom for adjustment, and very nicely adjusted and replaced. The index shows the different volumes of steam in the eudiometer due to the different temperatures of 212° and 228°, which being marked on the wooden handle, the intermediate volume at 216° may be readily obtained by a subsequent addition of such small quantities of salt to the fresh water bath, as will secure a fixed boiling temperature of 216° therein.

That diagram exhibits the unit of atmospheric steam accurately, and its apparent or visible increased expansion by heat, but not the real expansion, which being greater than the apparent, has still to be obtained by calculation and by increasing the apparent in proportion to the increased densities of the steam, according to the well known law of Mariotte, "that the volumes of all elastic fluids at the same temperatures are proportioned to their densities," and when that proper allowance has been made, the absolute expansion in the eudiometer will be found to correspond very nearly indeed with our previous general statement.

(To be Continued.)

Note.—We have some of Mr. Frost's pamphlets, which will be found very curious and interesting; the price is 25 cents.

The Atmosphere.

The atmosphere rises above us with its cathedral dome arching towards the heaven, of which it is the most famillar synome and symbol. It floats around us like that grand object which the Apostle John saw in his vision :—"a sea of glass like unto crystal." So massive is it, that when it begins to stir, it tosses about great ships like play-things, and sweeps cities and forests like snow flakes, to destruction before it. And yet it is so mobile, that we have lived years in it before we can be persuaded it exists at all, and the great bulk of mankind never realize the truth that they are bathed in an ocean of air. Its weight is so enormous that iron shivers before it like glass, yet a soap-ball sails through it with impunity, and the tinest insect waves it with its wings. We touch it not, but it touches us; its warm south wind brings back color to the pale face of the invalid; its cold west winds refresh the fevered brow, and make the blood mantle in our cheeks; even its north blasts brace into new vigor the hardend children of our rugged clime. The eye is indebted to it for all the magnificence of sunrise, the full brightness of mid-day, the chastened radiance of the gloaming, and the clouds that cradle near the setting sun. But for it the rainbow would want its triumphal arch, and the winds would not send their fleecy messengers on errands round the heavens. The cold ether would not shed its snow feathers on the earth, nor would drops of dew gather on the flowers. The kindly rain would never fall—hail, storm, nor fog diversify the face of the sky. Our naked globe would turn its tanned unshadowed forehead to the sun, and one dreary monotonous balze of light and heat dazzle and burn up all things.

Cotton Grown In spain.

The editor of a Barcelona newspaper says he has had an oppertunity of seeing some samples of cotton which was cultivated on the banks of the Guadalquivir, the superior quality of which can compete with the best that is imported from the American continent. He recommends that the cultivation of this most useful plant be extended to every part of the peninsula of Spain; the soil and temperature of which he says, are calculated to give rich results. The editor flatters himself that an intelligent speech lately made by Don Felix Rivas before the agricultural society, at Madrid, may produce the effect of extending the cultivation of cotton.

The chamois and ibex are found on the Alps as high up as 9,000 feet. The goat of Cashmer browses at a height of 13,000 feet above the level of the sea, and the Pamir sheep live at an elevation loftier than the granite peak of Mount Blanc.

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New Inventions.

Alarm and Thief Detector.

Mr. Nichols, of the U. S. Pay Department at New Orleans, has invented two very ingenious machines to answer for the purposes stated in the caption above. The alarm is made so as to produce a great noise when opened, similar to a locomotive whistle. This is followed by the descent through a tube of a quantity of sonorous balls (marble or brass, as may be chosen) which are at length thrown successively from a hopper to the floor, rattling with terrific force. In the midst of the confusion of sounds produced by the falling balls, a bell begins to toll, and so loud as positively to startle even a person who is prepared to encounter the alarm.

The machinery which puts in operation the alarm, occupies but a small space and can be put inside money safes, armories, or other pieces of furniture in which valuables are preserved. The noise created by it extends to a great distance and would effectually scare a thief to a precipitate flight. The Thief Detector is a simple and more portable piece of machinery, designed to be placed inside doors or windows of stores o dwelling houses, as a protection against depredators. It consists of a heavy grating which is suspended within a double groove in the upper part of the door or window frame, and connected by a spring with the floor beneath. Immediately the foot of the robber presses on the floor inside the threshold, the spring is put in action, when down falls the grating, and the intruder is caught like a rat in a trap.

A New Propeller.

Mr. J. Martin, of Philadelphia, is in this city, with a beautiful working model of a new improved single blade propeller, the invention of Mr. Alex. Bond, of Philadelphia, and to which Mr. Martin has added some important improvements. It is a very peculiar invention, having only a single blade, which, by a nearly direct action from the piston rods of two horizontal cylinders, attached to a slotted vibrating horizontal beam, operates the propelling blade at the stern, with a powerful sculling motion. The invention is a very simple, but a very particular contrivance at the same time. With a very clumsy boat, not made for a fair test at all, it ran with a small engine at the rate of 8 miles per hour, on the Schuylkill, at Philadelphia. It is patented in America; and as improved, measures have been taken to secure it in Europe.

A Controversy to be Settled.

It is well known that an empty bottle hermetrically sealed, when lowered to a great depth at sea, will come up full of water. The why and the wherefore of this result has long been a matter of controversy among scientific men. A gentleman who entertains an opinion that a bottle can be made that cannot be filled with water, has taken some pains to establish his position, by having two bottles of the form of globes made, of the thickness of three-quarters of an inch, which are without holes in any part. The bottles are to be entrusted to the care of Capt. E. E. Morgan, who sails on the 8th of February, in the packet ship "Southampton" for London,—one is plain, and the other ground with the name on it of "Southampton."

The subject is one that has occupied the speculation of so many, that this trial has occasioned a good deal of remark. The bottles are made with the belief that former experiments of the kind will be controverted by this trial. The result will be highly important and interesting.[—N. Y. Express.

This experiment has been fully tested already. See a letter, page 269, vol. 4, Scientific American. A glass tube hermetically sealed was sunk 89 fathoms on board the ship Tarolinta bound for California. It came up without the least particle of salt water in it.

Sign Letters of Earthenware.

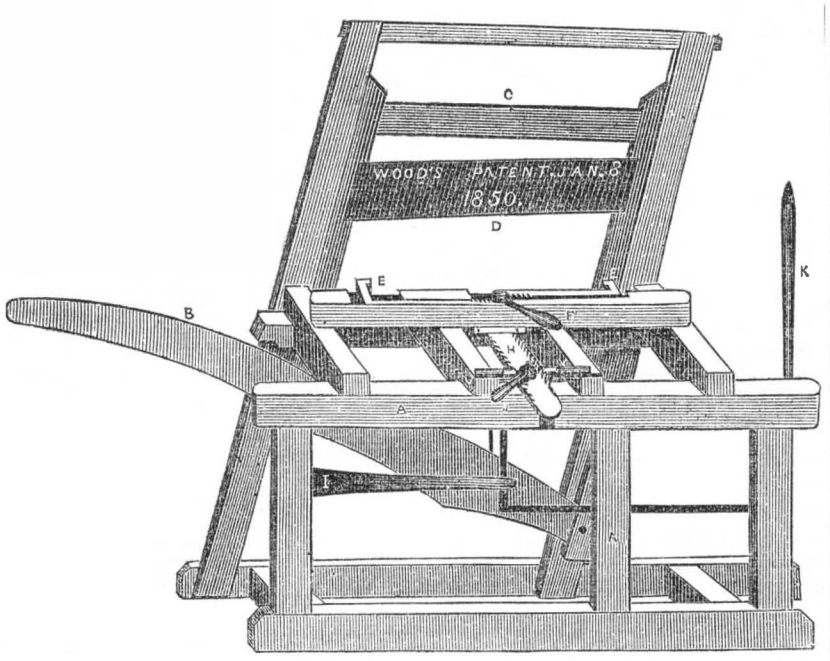
A number of signs have been put up in Elizabethtown, N. J., made of baked clay, of different kinds. Seme of them are glazed and some gilt.

Safety Apparatus for Steam Boilers.

Mr. J. H. Rawlins, of Hope Mills, Wrexham, England, has contrived an apparatus for steam-boilers, to prevent all accidents from explosion, whether occasioned by short water or over pressure. It consists in connecting to the common water-gauge of the buoy and wheel, with counterpoise, a hollow brass or iron tube, in lieu of the solid rod that works in the boiler top. The bottom of this tube is filled up with fusible metal, and the top is open, having attached to it a whistle. A small hole is bored in the pipes, outside the boiler, just above where the pipe stands when the water is at its right hight; and should this fall, say a single inch, the whole being within the boiler, a clear passage for the steam is caused, and the whistle sounds the alarm. On the other hand, if the boiler is overloaded from stoppage of the valves or any other cause, the temperature of the water rises, the fusible metal falls out and leaves a free passage for the steam as before. The cost of this apparatus is literally nothing, beyond that of the whistle, which may be a common mouth whistle, at the price of a shilling or two. At the same time it is never liable to get out of order, and may be put up by a workman of the most ordinary capacity.—[Exchange.

[An apparatus of this kind was patented in 1847, in the United States. The inventor we believe, is Mr. Fernauld, of Boston. There are many good inventions, respecting which the patentees are in great error in being so quiet about them.

WOOD'S PATENT SHINGLE AND STAVE MACHINE.



Sawed shingles, however simple the machine which makes them, are very inferior articles for use, in themselves, and besides the waste of timber in making them is enormous. No person will use any kind but the split shaved shingle, who has any judgment in the matter. Those machines, therefore, which split a good shingle and which are simple in their construction, are certainly the best. Among all the machines for this purpose, which have been brought before the public, from time to time, the one we now introduce to our readers, stands at the top of the list. As the feeding motion of shingle machines, is the main and most particular feature about them, it will be observed by the following referencial letters that the feed bar has a beautiful side to side vibratory motion and a progressive motion forward at the same time, to move the block to be split in that peculiar manner requisite to cut the shingles, finishing them in *good style*, ready for use as they come from the machine.

A is the frame; B is the lever for operating the slide and knife when hand power is employed; C is the slide or knife frame; D is the knife; E E are two dogs, which have a rack upon each of their inner ends, whereby they are moved nearer or farther apart from one another, by a pinion on the end of the handle, F. These dogs secure the block that is to be cut into shingles. H is a feeding rack bar which moves the small frame, represented by the transverse bar to feed in the block for forward every new cut. This rack bar has a vibratory side to side forward motion, given to it by two palls, V V, the one catches alternately on the rack bar on the frame, at the right angle to the knife, to cut the shingle.—There are two cams (not seen) on the front end of the rack bar, and these are struck alternately by the slide, C, when it comes down to vibrate the bar, H, changing the catch of one of the palls, V. On the back of the bar, H, is a knob, against which is braced a vertical rod, and I is a spring that presses always against it, to urge forward the rack feed bar. This spring keeps the feed up better than by employing the usual plan of weights, &c. K is a lever for throwing the feed table back when the block is cut into shingles.

One man and boy can cut 6,000 shingles per day by hand, or 20,000 by steam or water power. There are three sizes, the 1st cuts an 18 inch shingle—price $100; 2nd cuts a 24 inch shingle—price $110; 3rd, 28 inch shingle—price $120; with the right to use the machine in one place. Experience has fully demonstrated that these machines are among the best in use, being very simple and perfect in their operation. This patent was granted on the 8th Jan., 1848. Orders addressed (*p. p.*) to J. D. Johnson, Easton, Conn., or to Wm. Wood, of Westport, Conn., will meet prompt attention, as the machines are constantly being manufactured at the above places. Town, County or State rights can be obtained by application to either of the above named. For the benefit of our readers they can order the machines through this office, by enclosing the amount for either of the sizes named above. Specimens of the work may also be seen, by application, at this office, and they are such as will warrant us to say "they cannot be surpassed."

Improvement in Communicating Power to the Throstle Spinning Frame.

Stephen A. Packer, of Canterbury, Windham County, Conn., has made a valuable improvement on the Throstle Frame for driving the spindles, whereby he gains a saving of power in comparison with the old plan of 9 to 23. This is a great deal, indeed, making a vast saving in a factory in the course of a year. He dispenses entirely with a band cylinder, and uses only one horizontal grooved drum, driving two spindles with one band, and all the bands pass from the one drum. Measures have been taken to secure a patent.

Newly Constructed Oven.

Mr. John Case, of Burlington, N. J., has in operation an oven which is said to be of a new construction—the fire being in a separate chamber, while a valve in the chimney draws the smoke, gas, &c., entirely out of the oven before the bread is introduced, and the oven is kept constantly hot, by which mode bread, dinners, pies, or cakes can be baked at any hour when they may be wanted.

In our next number we shall publish an engraving, of the Great Dam at Hadley Falls, Mass., furnished us by Mr. Foote, Assistant Engineer of the work.

To Dye Black Satinet, Muslin de Laine, and other Goods which have a Woollen Weft and Cotton Warp.

Dye the woollen part first by preparing the wool with the sulphate of iron, about 3 oz. to the pound of wool and a small quantity of the sulphate of copper. At this ratio of iron preparation the woollen goods should be boiled in a suitable quantity of water for three-fourths of an hour. If the goods are in pieces they have to be kept continually turning on what is termed a winch. After this boiling they are taken out, dried, and dripped. They are then dyed with logwood, at the rate of three pounds to the ten pounds of goods. The boiling should be continued one hour at least. They are then to be taken out and well washed, and then left to steep for eight hours in cold weak sumac. They are then to get a dye of what is termed the cotton process; viz., first handled in weak cold limewater, then taken out, dripped, and run through a solution of copperas, then dripped, well washed and afterward run through (not very strong) a solution of logwood. All they want now is to be washed and dried. This dyes both the wool and cotton. As wool is an animal and cotton a vegetable production, the processes to dye them are entirely different, and this is the reason why so many fail to dye a black upon such kinds of goods. No hot sumac should be used, or else the wool will become very brownish in color.

Scientific.

M. M. Malaguti Durocher, and Sarzeaud announce that they have detected in the waters of the ocean the presence of copper, lead and silver. The water examined appears to have been taken some leagues off the coast of St Malo, and the fucoidal plants of that district are also found to contain silver. They state also that they find silver in sea salt, in ordinary muriatic acid, and, in the soda of commerce; and that they have examined the rock salt of Lorraine, in which also they discover this metal. Beyond this, pursuing their researches on terrestial plants, they have obtained such indications as leave no doubt of the existence of silveri n vegetable tissues. Lead is said to be always found in the ashes of marine plants, usually about an 18-1000000th part—and invariably a trace of copper. Should these results be confirmed by further examination, we shall have advanced considerably towards a knowledge of this phenomena of the formation of mineral veins.—[London Athæneum.

[We belive the above to be a piece of sheer nonsense. It is wonderful how many strange discoveries are made in France.

The Brittania Bridge.

We learn from Menai there is at length a complete roadway over the Straits, the second great tube having been safely raised to its 100 feet elevation, and forming by its junction with the other tubes a continuous rigid wrought iron highway 1840 feet long, and between 5000 and 6000 tons in weight. The workmen are now engaged, day and night, in completing the junctions and adjustments. The greater portions of the permanent way and rails for the trains is laid. The grand approaches to the bridge at either end, where the collossial lions rest, are finished, including the continuation of the line of rail to the stations on each side at Bangor and Lanfair, and every exertion is being made to have the line complete by the end of February, for the first trial trains to go through.

The Cuban Plow

The plow seed in cuba, is of the rudest form:—A pointed piece of iron, shaped like a wedge, attached to a wooden tongue and drawn by a pair of oxen, without yokes; the beasts there bear the weight of their burden upon their heads, (not necks) and pull by their foreheads, the rope being drawn tightly around the horns. Of course, the plough just described turns no furrow, but merely roots up the ground.

Great Steamboat.--Scientific Challenge.

We would call the attention of our readers to the letters containing a most extraordinary steamboat challenge, on another page. If accepted tens of thousands are ready to be bet upon the result.

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Scientific American

NEW YORK, FEBRUARY 23, 1850.

Improvements in Rail Roads in Virginia—Governor's Message.

Governor Floyd, of Virginia, has sent a message to the General Assembly, recommending them to build a rail road to connect the depot of the Fredericksburgh and Petersburgh Rail Road, to test fairly an invention of James S. French, Esq., of Elizabeth City, Va., whereby he proposes to ascend much higher inclines than the greatest now overcome, and likewise prevent the cars from being thrown off the track, by any ordinary accident.

As we do not know exactly, the full nature of this invention—the means proposed to accomplish these desired objects, we cannot say anything about it. We will, therefore, briefly review the Message of the Governor, as there are some points in it worthy of attention, and upon which we believe we can throw some light.

He says: "Railroads have failed in many instances to realize the anticipations of their projectors," (as subjects of investment for capital,) "owing to the increased weight which has been given to the locomotive since its first introduction. This weight is still increasing, and from a little over three tons in 1829, in England, it has now reached 40 tons; and on many of the our northern roads, 30 tons, and on our southern roads, 15 to 20 tons." (The rapid destruction of heavy rails, he attributes to the weight of the locomotive.) "The locomotive of 1829, with enlarged wheels, and two or more driving wheels, with a great addition of size and weight, is the locomotive of to-day. They draw no greater loads in proportion to their steam power, nor have they added anything to their adhesion or fulcrum for progressive motion, but sprinkling sand upon the rails and by various devices, heaping weight upon the engines; nor up to the present time, have any means been devised for keeping the engine and cars from being thrown off the track."

Here, we differ in opinion from Governor Floyd. By the above, the idea is conveyed, that it is customary to sprinkle sand on the rails to make the wheels adhere to them. This is never done except when the rails are wet, (to start,) or grease has been sprinkled on them, and this is seldom done. It is true that the weight of the engine is employed to give greater adhesion to the driving wheels, and this is a peculiar feature in the system; but surely the increased weight of locomotives is a great improvement, if not, our railways have been improving backwards. It is well known that with the increase of weight in our locomotives and the increase of weight in the rails, so in proportion have our railroads become profitable. This is true of the whole line in this State, from Albany to Buffalo. Many plans too, have been devised, to spread over or throw the weight at pleasure upon and off the driving wheels, so as to throw great paying weight upon the driving wheels when ascending inclines, and then spread it upon the other wheels when running on levels. Dr. Lewis, of this city, invented a plan to do this more than three years ago, as illustrated in No. 25, Vol. 1, Scientific American. The same invention also provides a very ingenious plan for preventing the cars from running off the track. We have also seen many other plans for accomplishing this same thing. The question with Gov. Floyd is this: "Can the weight of the locomotive be safely reduced and the engine still retain its capacity for usefulness? He believes it can, and so do we; but will all its useful effects be maintained? We say yes, when light trains are not drawn: but we say no, when heavy trains are to be drawn. This accords with the past experience of the railway system.

A locomotive weighing only 9 tons, named the "Fairfield," on the Bristol and Exeter R. Road, Eng., has carried 50 passengers at the rate of 24 miles per hour, 32 on the level; and it ascended a gradient of 35 feet to the mile, and 3½ miles long. Gov. Floyd says, that there is only one ton in the six, of adhesion in the locomotive, and at that rate, there would be only 1½ tons in this 9 ton locomotive. It could not then by any common possible means, have drawn 50 passengers, whose united weight would be no less than 3 tons. How ihen did it draw its load at all? and how did it ascend the incline of 35 feet to the mile?—We will answer. The weight of the passengers was used as an adhesive power; the very thing which Gov. Floyd says is wanted, so as "not to depend upon the weight of the engine." He is, therefore, positively correct in his theory; but it has been carried out into practice already. But it can only be useful for light trains. This was the opinion expressed by R. Stevenson, C. E., (and there is no man more capable of judging,) at a late meeting of the Institution of Civil Engineers. We, however, like the recommendation of Governor Floyd—there is nothing like experiment for testing the value of an invention. We have no doubt but there are many excellent inventions slumbering in neglect, because the inventors of them have not the means to bring them into favorable notice; and the invention of Mr. French, may be of very great value and importance.

Explosions of Steam Boilers.

We believe we are not saying too much, when we assert that no subject, from first to last, has engaged so much attention and has been the object of so much investigation as that of "Steam Boiler Explosions." It has often engaged the attention of Congress, and Report after Report on the subject have been issued by the Commissioners of Patents. Juries without number have sat to determine the cause and report on the same, but all these things—reports, decisions, investigations and what not—have been nothing but mere shams, so far as it relates to the good accomplished by them. It may sound well to hear of philanthropy contributing its thousands for the benefit of those whose friends have been sent in a moment to eternity. This is right—but will this bring the dead to life, will it animate the ashes of the urn, or will it prevent such catastrophies occurring again. We answer, no. The only way to prevent such accidents, is the *certain* fear of punishment to those who are the principal causes of them; and who are those? Generally the proprietors, or those who have the supreme command. Cupidity is at the root of all the evils. Every body knows that the bursting of a boiler is caused by the pressure within being greater than the binding force without—the steam becoming the Sampson, the boiler the binding *withs*.

The late explosion in this city, whereby 63 persons were killed, has been the subject of investigation by a jury, of which Mr. James Renwick was foreman. The witnesses examined were men of scientific attainments, and the majority of them of great practical experience. Looking at the names of those witnesses, we would expect that if any testimony would be of the least benefit to guide us to a correct conclusion respecting the cause of said explosion, it would be the testimony of those men. But what do we find? Very contradictory opinions indeed: one, a practical boiler maker, believed that the boiler could stand a pressure of 100 pounds to the inch; while another believed that it could only stand the pressure of 40 lbs. (We cannot go over the evidence, because it is very long.) We had hoped that the jury would have given some reasons for the verdict which they rendered, but none were given. The following is the verdict:—

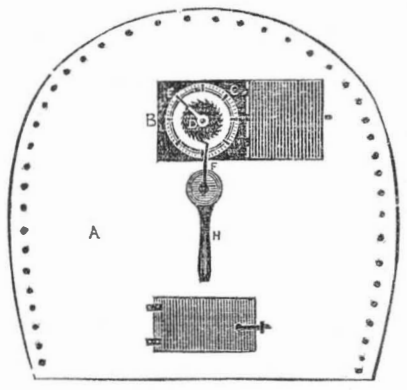
First—That Messrs. A. B. Taylor & Co., were the direct cause of the recent explosion in Hague street.

Second—That Messrs. Walker & Milligan were the indirect cause of the recent explosion in Hague street.

Third—That Messrs. Pease & Murphy are deeply reprehensible in selling the boiler, knowing its imperfections, and after it had lain in the open air for more than one year.

From the evidence submitted we are of opinion that verdict first was all that was required. By an examination of the boiler, a few days before the explosion, Mr. Birbeck told Mr. Ford, in the presence of Mr. Taylor, the proprietor, that it was not safe to carry any more than 40 or 50 pounds pressure of steam. After this what do we find? The steam increased to 100 lbs. pressure. They wished to get 60 per cent. more out of the boiler to the danger of life and limb, than the boiler was capable of performing. Oh, cupidity, what sins thou must answer for! What would be done to the man who would wantonly or selfishly load a twelve pounder with grape and fire it through one of our crowded streets? He would be consigned to the scaffold or State Prison for life. Look, then, at the act of increasing a pressure of 60 pounds on that boiler. It amounts to the astonishing presssure of 4 tons 640 pounds on the square foot. What terrible effects such a pressure is capable of producing, when, like a maddened giant, it bursts from its weak fetters. The cause of the explosion was a too great pressure of steam, and the dreadful effects produced were the result of quantity also—in other words, the pressure was high and the water was low. The boiler might have burst with the pressure while it had plenty of water, but the effects would not have been so disastrous. Two hundred cubic feet of steam, at the same pressure. is just double the effective power of one hundred, and would produce double the amount of labor under control, and double the amount of damage by an explosion. It is true, that as the steam had room to expand, its effective pressure would decrease, but then we have its destructive velocity,—as Mr. Paul Stillman expressed himself, "a tornado let loose."

What are the remedies for the evils of explosions? We answer. A plentiful supply of water in the boiler, and a pressure commensurate with its strength. Mr. Dunham and other witnesses stated that careful engineers and good guage cocks were the best safeguards. No one can doubt this. We believe however that a "tell-tale" attached to the guage cock, and shut up from the fireman, would be a good thing. Various plans could effect this object. Here is one:



A is the boiler. B a view of the box, (to be locked up); C is a dial; D a ratchet wheel on a spindle, which has a pointer, E, on it; turning and pointing to the dial. F is a ratchet attached to the upper part of the guage cock, handle, H. By turning the handle to test the boiler, say every 15 min., one tooth of the wheel would be moved round, and a wheel of 40 teeth would answer for 10 hours. The box should be examined every hour by the Superintendent whether it is the Chief Engineer or some other person. It may be said, that "it would be easy to turn the wheel round four times at once, if it had been neglected before. The man who forgets his duty once, would not be likely to remember how many times he had neglected it; and for a certainty, it would lead to regular habits of examination—and "habit is second nature." It would be easy to place a vertical spindle in combination with the ratchet wheel, and it might extend up to a room above the boilers, and be carried by bevel gearing, either into the Engineer's or Superintendant's room; and then the little dial would faithfully report the duty performed below.—Every mechanic will understand how this may be accomplished.

Steam boilers should be kept in a place apart from the main building or factories, and above all, we recommend prompt punishment for all who may be the direct cause of such accidents. Let the *fear* of the law be the beginning of wisdom.

The questions now to be asked, are: Will this investigation lead to the adoption of effective measures for the prevention of the like evils? Will this catastrophe lead to no definite results, whereby the lives of innocent working people and the travelling public will be more safe? Will cupidity and recklessness still be allowed to hold up their brazen fronts and offer Pilate's mock oblation? There is too much false philanthropy in our midst. Justice must reign as well as generosity—they must go hand in hand, or there can be no safety.—By two recent explosions, the one in N. Orleans and the other we now speak of, no less than 300 of our fellow beings have suddenly been deprived of life. In Rome, he who saved the life of a citizen was rewarded with a great public honor, but the lives of our citizens seem to be held at a low valuation. If this is not so, why do the guilty go unpunished?

An engineer would rather work an engine at a low, than a high pressure; but he has not his choice in such matters—he must make the engine do the work, and the value of many engineers is estimated by their recklessness. The laboring force of an engine is not in its piston-rod, crank, or shaft; it is the steam that is the power. How often have we heard men say; "what an astonishing amount of work we get out of that little engine. We only bought it for ten-horse power, and it works up to fourteen; it makes things hum like a top." They do not seem to know that the boiler is the magazine of power, and that with their increase of power, they are risking the lives of the innocent.

Cheap Postage.

We are gratified to perceive that strong efforts are being made here and in other parts of the country, to effect a still farther reduction in the rates of postage. This subject is confined to no section or class, it is universal,—a point that seems to be overlooked by the wise savans congregated at Washington. The Cheap Postage Association, in this city, passed a resolution to the effect:

"That as one of the original and fundamental objects of the Association is to effect a postal reform, by which pre-paid letters, under half an ounce, shall be carried for TWO CENTS to all distances in the United States, it be recommended to the friends of cheap postage throughout the Union, to petition Congress to establish this rate."

It is certainly important to petition Congress, if any further reduction is desirable, as it cannot be accomplished in any other way, and we hope to see the people moving strongly in the matter from all quarters. We can learn a profitable lesson on this subject from Great Britain.

The Iron and Zinc of New Jersey.

In New Jersey there is an abundance of the red oxide of Zinc, combined with Franklinite, This latter is an iron ore resembling small black peas. It is peculiarly an American ore. For a long time this ore, and the Zinc, lay silent and useless; but now good metal is made out of both. The Zinc is superior to the zinc of commerce, and the Iron is equal to the very best iron known in commerce. The iron is of a strength equal to 77,000 lbs. per square inch, and the zinc equal to 10,000 lbs. We believe that the best Swedish iron is only of the strength of 72,064 lbs., and the best English is only 61,000.

Receipts for Washing.

We have received quite a number of receipts from friends respecting different ways to shorten the process of washing. We are very much obliged to them for the interest they take in casting their gifts into the treasury of science. This is a subject with which we are intimately acquainted, chemically, and no doubt many who have but lately adopted some new improvement are not aware that the said improvement has been long applied in public works—such as bleach works.

We are daily receiving long tedious letters from subscribers which require more time to read than we can devote to them, without trespassing upon time which is valuable to us. In all such cases we are obliged to put them on file, and take them up in regular order, and we have to request in future that subscribers writing long letters will bear with a little delay, recollecting that no letter from a subscriber, which is post-paid, escapes attention either through our columns or by mail.

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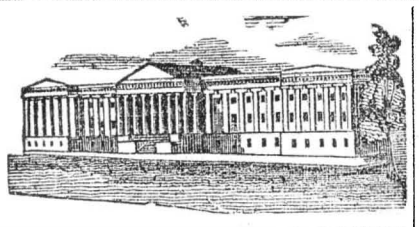

LIST OF PATENTS CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending February 16, 1850.

To S. Andrews, of Perth Amboy, N.J., for improvements in Barrel Machinery.

1st, I claim, the eccentric groove and cap extending over or around the shaft to the side opposite the knife, the said constituting a part of the eccentric cam ring passing around the shaft, and having an opening through the said cam ring at the posterior termination of the cap, where the staves make their exit.

2nd, I claim the whirl or secondary shaft, as described, in combination therewith.

3rd, I claim the right and left stave holders in the jointer, having flanges or thumb-pieces to support the edge of the stave during the operation of jointing, and to ensure an equal width at each end.

4th. I claim the horizontal jointer in combination with an inside and an outside frame, to which the right and left stave holders are attached by hinges, and by which arrangement four or more boys may work around one horizontal wheel or jointer and operate simultaneously, being also thereby enabled to joint the staves with the grain of the wood, without loss of time.

5th. I claim the movable centre in the head machine in connection with the opposite face plate on an universal joint, between which the head block is held before it is brought in contact with the rubber of the face of the chuck, and the slide which holds the chisels, constructed substantially in the manner set forth.

6th. I claim the combination of the cutter with the jointed spring cutter and levers, for cutting the locks in wooden hoops, substantially as described.

To F. Bradshaw, of Greene Co., Ala., for machine for cutting cotton stalks in the field.

I claim the adaptation of iron and steel knives or cutters to the cutting down and cutting to pieces of cotton stalks either in a green or dry state, in the manner and for the purpose described.

To A. C. Carey & D. C. Bagley, of Amesbury, Mass., for improvements in machinery for Folding Cloth.

What we claim is the mode of folding and laying the cloth on the table or platform kept in a state of equilibrium by the weight, wheel, chain and rod, which, by means of the notched bars attached to the radial rods secured to the shafts, with combs attached to the shafts, and segmental plates, bent bars, and horizontal and inclined connecting rods, and slotted arm or crank, constructed, combined, arranged and operated as herein set forth.

[An engraving of this machine will be found in No. 5, this Vol. Sci. Am.

To C. Chinno k, of New York, N. Y., for improvement in Rule and in Socket Joints.

I claim the application to the rule joint and and to the ball and socket joint of the rod which is hinged into the ball or rule joint, to hold the joint as firm as desired, by means of the spiral spring on the india rubber spring as described.

To J. Dermond, of Paterson, N. J., for improvement in arrangements of Fliers and Spindles.

I claim the manner of suspending the flyer separate from the spindle by the flyer being connected to and forming a part of the tube, the lower end of which revolves in a socket bearing, allowing the spindle of the bobbin to pass and move through it without touching it, so that however great the speed of the flyer may be, it will be prevented from vibrating the spindle.

To H. A. Engles, of Cincinnati, Ohio, for improvement in Air-heating Furnaces.

I claim constructing a furnace for heating air, with a spiral flue passing up between concentric cylinders when this is combined with a conical roof to the furnace, within the inner concentric cylinder, thus obtaining the most extensive radiating surface within the least space and in the most compact and simple form.

To Geo. Flautt, of Cave Town, Md., for improvement in Augers for Boring Machines.

I claim making the pod of an auger separate from the stem on which it is revolved with a considerably greater velocity than the cutting bit substantially as herein set forth.

To B. Hovey, of Brookfield, Vt., for improvement in Horse Rakes.

I claim the method of working the rake head by means of the treadle, in combination with the hand bars and the back piece, as described. I also claim the attachment of the stilts to the thills, in the manner and for the purposes described ; all of which gearing being so arranged that a person on his seat, may change and discharge, or suspend the rake held at pleasure, as herein set forth.

To M. G. Hubbard, of Hume, N. Y., for improvement in hanging carriage bodies.

I claim the combination of cross reaches and spring, substantially in the manner and for the purpose set forth.

To James Ingersoll, of Grafton, Ohio, for improvement in Railroad Trucks.

I claim the combination of an endless track on the frame of the carriage with an endless series of rollers running thereon and guided by flanges ; the endless track being supported on the peripheries of the rollers which intervene in endless succession between it and the surface of the ground or rail, and which are broad enough to keep themselves erect and steady without the use of axles or rods extending across the carriage.

To N. G. Norcross, of Middlesex Co., Mass., for improvement in Planing Machines.

I claim the combination of the rotary planing cylinder, and the rest, with mechanism, by which the two can be freely moved up or down simultaneously, and independently of the bed or platform, or any analogous device, substantially in the manner and for the purpose of reducing a board to equal thickness throughout its length, all as herein above specified.

I also claim making the under side of the rest concave, in combination with so extending the part under the rest, and applying it to the concave part thereof, as to cause the board as it passes across the rest to be bent and presented with a concave surface to the operation of the rotary cutter planing cylinder, substantially as specified, the same being for the purpose before mentioned.

To F. A. Rockwell, of Ridgefield, Conn., for improvement in Bedclothes' Clasps.

I claim the use of the cam and lever, acting on the spring, to constitute a clasp in the manner and for the purpose set forth.

To Wm. H. Rosenthal, of New Oxford, Pa., for improvement in Tanning Apparatus.

I claim, first, revolving the tanning cylinders alternately in opposite directions substantially as herein set forth.

2nd, Handling the hides in the spent liquor from the tan vats, substantially in the manner herin set forth.

3rd, Liming hides or skins in a close revolving cylinder, substantially as herein set forth.

To L. Smith, of Troy, N. Y., for improvement in Smut Machines.

I claim, first, the grates in the top of the machine, in combination with the scrolls or spiral chambers and spouts for discharging smut and other light materials carried up by the blast, as set forth.

2nd, I claim the chamber at the bottom of the cylinder which concentrates and gives free discharge to all foreign matter to be separated from the grain by the blast in the last stage of operation of the machine, in the manner described and represented.

3rd, I claim in combination with the concave bottom which gathers the grain for its discharge from the machine. The distributors which give direction in the discharge of the grain separated from the foreign matter by the blast.

4th, I claim the draft floats, in combination with the scouring surfaces, for cleaning buckwheat, as set forth. The whole being constructed, arranged and operating substantially as set forth.

To S. B. Snedaker, of Cincinnati, Ohio, for improved method of bolting in window-shutter openers and fasteners.

I claim fastening the window blind at any suitable point by means of bolts projecting on opposite sides of the pintle of the hinge by a driver, the bolts and driver being suitably guided, and the bolts passing into suitable notches on a plate attached to the blind or to the upper leaf of the hinge, thus not only retaining the blind in any desired position, but also at the same time relieving the pintle of the hinge from any strain athwart its axis, the whole being arranged substantially in the manner and for the purposes described.

To Wm. S. Thomas, of Norwich, N. Y., for improvement in Electric Telegraphs.

What I claim is the making of signals or marks for telegraphic purposes by the agency of the heat generated, induced or controlled by a current of electricity passed along attenuated conductors, wires or points, substantially as herein set forth ; the signals being the flashes of light emitted by the heated conductor or points are manifest to the eye of the operator ; the marks being produced on the paper by the heated points or conductor are the record of the message.

To S. B. Ulmann, of New York, N. Y., for improvement in Castors for furniture.

I claim neither the ball, the socket, the vertical pivot, or either of the pivots of the ball, but the combination of the whole as above substantially specified, whereby the ball of the castor is enabled to revolve across the two centres of the two axes of the ball.

To Geo. Vandenhoof, of Paterson, N. J., for improvement in connecting Trucks with Car-bodies.

I claim the mode of attaching car bodies to Trucks by means of the trough, (with the sloat and king bolt) and the rail, constituting the segment traverse, as above described.

To S. West & H. Plumb, of Honesdale, Pa., for improvement in machinery for turning umbrella sticks, &c.

We claim the combination of the hollow shaft or cylinder, graduating cutters or knives, made and ground exactly alike, and arranged on opposite sides of said shaft or cylinder and cutting inward and in exact unison with each other—the feeding rollers arranged in front, and the receiver or carriage, arranged in the rear of the shaft, together with the case, U, surrounding the cutters and wings, for enabling them to act as a fan or blower to discharge the shavings : the whole being arranged and operated substantially as set forth.

To James P. Heiss, of Philadelphia, for improvement in Studs for shirt-bosoms.

I claim constructing the shank in two sections the first being fixed to and projecting from the back of the stud, and the other being hinged to the first in such manner that it can be brought in line with or be turned across it, as herein set forth, but I make no claim to the mere fastening of a stud, by means of a cross bar attached to a chain, or other similar arrangement.

RE-ISSUES.

To Wm. Beach, of Philadelphia, for improvement in Curry Combs. First patented March, 13, 1849.

I claim combining the trough-shaped bars, which have the comb-teeth on their edges, with the folded strips of metal and with the wires running through them in the manner substantially as herein set forth, so as to form a curry comb with open or hollow back. I do not claim separately either trough shaped comb-bars, or combs with open backs, but only in the combination herein set forth.

I also claim the shank constructed with the fastening hole therein, made without drilling or welding, and combined with the comb as herein above described, so as to act as guards to the ends thereof.

DESIGNS.

To S. D. Vose, of Albany, N. Y., for three designs for three Stoves.

They are much more liberal in England on postage affairs than we are. A single printed volume, without cover, and open at one end can be posted to any part of the kingdom at sixpence a pound.

The Astronomer, Leverrier, has announced to the Academy of Science that the sun experiences a very considerable peturbation not hitherto calculated.

Inventors and Patent Agents.

We notice by reference to the Patent Office Report of Ex-Commissioner Burke for the year 1848, (a full copy of which has just been sent us by the present Commissioner) that the whole number of applications for patents received during that year, amounted to 1628, out of which number only 660 were granted—a fact which we have before noticed. The cause of many rejections, no doubt, results from the loose and ambiguous manner in which inventors allow their papers to be presented to the office, causing the Examiners much trouble in arriving at a proper understanding of the nature of the invention, and extent of claim. We not unfrequently meet with those who, for the sake of saving five or ten dollars, entrust their business in the hands of those who are perfectly ignorant of the Patent Laws, or the manner in which the drawings and specification should be made out, and more particularly that part (the claims) which require much care and attention, in order that they may be properly based. Many inventors suppose that business of this kind naturally forms a part of the profession of a well-bred lawyer ; the idea is a mistaken one ; very few lawyers are sufficiently versed in the arts and sciences to enable them to describe properly the nature and operation of a mechanical combination, and hence it is that in a majority of cases the inventor is either subject to the mortification of a rejection, or an increased expense in having his papers returned for proper amendment. We feel it our duty to caution inventors against entrusting their interests in the hands of incompetent and inexperienced persons, rather seeking advice and counsel from those whose position enables them to render it properly.

There are in this and other cities Patent Agents to whom inventors can apply with confidence, that an honest opinion will be given, while at the same time it cannot be expected that the adviser's opinion will be sustained in every case by the Commissioner : some allowance is necessary, inasmuch as human judgment is not infallible. In giving advice to inventors we have ever made it a point to speak as we think, and we confidently assert that in proportion to the amount of business yearly transacted at our office, as few rejections follow as from any other respectable agency. If we should attempt to make application for all the inventions that are presented to us for consideration, we should require an examining force, ten times larger than we now have.

It is not to be disguised that inventors are many times unreasonable in charging upon their agents "foul play," whenever they fail in obtaining a patent for their invention, which may have been regarded by the Commissioner as infringing another patent ; they should bear in mind that in order to conduct a successful business, the man who establishes himself as a Patent Agent, has an object in securing the confidence of the inventive community, in order that his business may become to him a source of importance. This could never be accomplished by an intended false expression of opinion, or a manifest disposition to secure his fees, leaving the interests of his client altogether out of the question. In transactions of this kind a man's success depends upon careful management, and not upon how many inventors he can secure to start with, for according to the terms upon which patent business is transacted in this country, it would take a long time to become a Crœsus or an Astor, while depending solely upon the paltry sum which is usually paid for a well executed set of drawings and a specification.

In conclusion we have only to state that we shall continue to advise with all who may choose to make application to this office, and also to conduct Patent business with our usual facility and despatch. We do not intend, in any case, that an inventor shall be compelled to wait week after week for his papers, after he has deposited the model in our hands.

Lord Brougham has been lecturing on light at the Institute in Paris, with great success. He demonstrated on the blackboard, chalk in hand, a variety of novel problems.

Perhaps there is no man in the whole world, take him for all in all, that possesses so much general information.

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TO CORRESPONDENTS.

"H. L. T., of N. Y."—We like your plan of a propeller well. It is certainly new and patentable, so far as we can judge, but you know that it is not possible to decide upon its merits without experiment. Why? Because there is no real theory on the subject as derived from a similar invention. There are great differences of opinion among the best engineers on this subject. We advise experiment first, for after all this alone will give it a character of whatever kind.

"A. T. B., of N. Y."—Evans' Millwright's Assistant, sold by Messrs. Appleton, N. Y., would suit you very well. There is no work on the Cotton Manufacture later than Ure's. We want a new work entirely, to embrace recent improvements. "Wightwick's Hints" would suit you best.

"G. W. H., of Ind."—We are afraid that the Steam Traveller, will not answer. Steam carriages for common roads have been tried before. One of them was described in Vol. 3, Sci. Am.

"I. S., of Mich."—We have seen a machine for punching the peg holes. It was made by Bigelow. It is now about a year since we saw it. It was for the heels, but he stated that he had also one for the soles. Your composition is for a valuable purpose, but it is only as a composition (combination) that it could be patented. We differ from you in opinion about the railway speed. We believe that the plan would be too expensive, and we are doubtful if it would operate. The firm immoveable track has proven to be the best, a positive traction on the rails is required or the locomotive will not run.

"J. A. F., of Ala."—Steam will not move into a vacuum chamber with accelerated velocity, but the reverse. There is one principle clear and plain—that "action and re-action are equal." All that can be done, at the very best, is simply to get the full power of the steam. We will say no more about it, but advise an experiment. Whitelaw and Stirratt's Wheel is now of a *good old age*.

"J. M., of Miss."—We cannot see how a patent could be refused. It is a new article of manufacture.

"F. T., of N. Y."—We believe that your improvement on the revolving rake is patentable, and that it is good.

"J. A. C., of Pa."—We have seen a lock nearly resembling *that* one, before. You will find the information desired in a work by A. Vail, on the Telegraph. There is no late American work on Electro Magnetism. Silliman's Journal Journal is $5 per annum.—Write to New Haven, Conn.

"W. H. A. C., of Mass."—The strength of a boiler is only calculated by its weakest part. The only safety is to prevent the water from getting low and not let the pressure be too great.

"E. X. of Phila."—Yours next week.

"E. W., of N. H."—You could not understand the machinery without an engraving. It consists of a pantagraph and a frame that holds the wood to be cut, the said frame being moved backwards, forwards, up and down, by the pantagraph to the drill, to cut the letter of the pattern.

"J. C. F., of Conn."—You had better address a letter to Pease & Murphy, of this city, for information concerning the boiler, as we have none for sale. $2 received.

"J. O. of Pa."—You had better inform us of the precise nature of your improvement, it would perhaps be best that you construct and forward a model for examination. We do not know of any work treating upon your business, neither are we able to advise you as to who would be the most responsible men to deal with here, such knowledge is not in our way. Your books were sent by express.

"O. P. S. of Ohio."—Your plan is novel without doubt, but its utility must be determined by actual experiments. Many things appear well in theory but fail in practice. You are aware of this probably.

"J. S., of N. Y.—We will publish the information, but the shaping and pressing cannot be taught by words, it must be learned by practice.

"E. B, of Conn,"—your article on iron pipes came too late for attention this week, it will be examined in season for next week. Your criticism upon the Condenser is altogether short of the mark, as the improvement is now covered by Letters Patent granted a few weeks since, we are not insensible of the progress which has marked the past 15 years.

"H. H. M. of Ill."—We have examined into your matter, and think you can obtain a patant for the foundations. It would cost about $50 to make the application. A model would be required, showing clearly the nature of the invention. It can be forwarded by express.

"R. K., of Geo."—Your order for books has been received, please inform us how we shall send them. The package is too large for the mail.

"C. D., of Ohio."—You could not obtain a patent on the mere form of the cylinder. $2 received.

It would be quite troublesome for us to keep the run of the Isthmus steamers, as they are somewhat irregular in their time of starting.

J. C., of N. Y.. E. F. W., of Ct., and F. G. U. F., of Mass.—Your business is being delayed from your non-attention to the execution of your papers. Please return your specifications immediately and thus facilitate your applications.

J. M. B., of N. Y.; A. & M. B., of Ill., and B. S., of Little Falls—

The specifications and drawings of your several inventions lie as a "dead letter" in this office for want of funds to pay the Patent fees. Will you attend to this matter, gentlemen? It is of more importance to you to have your applications on file at the Patent Office than to us; our advice is rendered from disinterested motives, as far as we are concerned, but for your own interest we advise you to remit the amount of your bills at once.

Money received on account of Patent Office business, since Feb. 13, 1850:—

L. G., of Conn., $50; J. D. H., of N. Y., $30; S. A. P., of Ct. $20; L. A., of Ct., $20; H. & R., of N. Y., $30; T. F., of Ct., $30; S. & H., of Mass., $30; S. T. F., of N. Y., $10, and G. S. .T, of Mass., $45.

Notice

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

ADVERTISEMENTS.

A LIST OF VALUABLE SCIENTIFIC AND MECHANICAL BOOKS,

FOR SALE AT THE SCIENTIFIC AMERICAN OFFICE.

Ranlett's Architecture, 2 Vols., bound, -	$12,00
Ewbank's Hydraulics and Mechanics, - -	2,50
Gilroy's Art of Weaving, - - - - -	5,00
Gilroy's Art of Calico Printing, - - -	5,00
"Scientific American," Vol 4, bound, - -	2,75
Minifie's Drawing Book, - - - - -	3,00
American Steam Engine, Plate and Book of Description - - - - - - - -	3,00
Scribner's Mechanics, Tuck, Gilt, - -	1,50
Treatise on Marine and Naval Architecture,—published monthly, 12 Nos., each - -	,75
Leonard's Mechanical Principia, - - -	1,50
Mahan's Civil Engineering, - - - -	3,00
Morfitt's Chemical Manipulations, - -	2,50
Instructions for Testing, Melting, and Assaying Gold - - - - - - - -	,25
Dugan's great work on the Stone, Iron, and Wood Bridges, Viaducts, &c., of the United State's Railroads. Published monthly in parts to be completed in 12 parts. Parts 1 and 2 now ready, each - - - - - - -	,75

N. B. This work is supplied to subscribers only.

Patent Office.

128 FULTON ST.

NOTICE TO INVENTORS.—Inventors and others requiring protection by United States Letters Patent, are informed that all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

Arrangements have been made with Messrs. Barlow and Payne, Patent Attornies, in London, for procuring Letters Patent in Great Britain and France, with great facility and dispatch.

MUNN & CO.,
128 Fulton street, New York.

SASH AND BLIND MACHINE—Patented by Jesse Leavens, of Springfield, Mass., is the best Sash and Blind Machine now in use. The Machine cost $300 at the shop where they are made, near Springfield—extra charge for the right of using. The machine does all to a Window Sash and Blind except putting them together. Orders from abroad will be promptly attended to, by addressing JESSE LEAVENS, Palmer Depot, Mass. 22 20t*

THE GRAEFENBERG MANUAL OF HEALTH.—The Manual of Health just published by the Graefenberg Company, 7 parts, 300 pages, 12mo. This is the most useful and comprehensive, as well as the cheapest medical work extant, and should be in the hands of every family. Part 1st contains an account of the different medical theories of the present day, both good and bad, and their relation to the health of the community. Part 2d presents a new doctrine: The Americo-Graefenberg System, which need but be understood to command the confidence of the whole community. Part 3d describes the causes, symptoms and treatment of almost every form of disease, including those diseases peculiar to females and children, useful to all classes, even to physicians, as a hand-book. Part 4th contains important directions for preserving health, &c. Part 5th, Hints for Nurses, treatment of persons recovering from sickness, cookery for the sick, &c. Part 6th, Domestic remedies described, including mode of raising and preserving medicinal roots, &c., making lotions, poultices, colognes, cosmetics, &c. Part 7th contains a collection of useful tables, recipes, &c. For sale at the office of the Graefenberg Co., 50 Broadway, and by booksellers generally. Price 50 cents. Liberal discount to dealers.

NOTICE TO POSTMASTERS.—As it is the wish of the Company to distribute this work extensively, any Post Master forwarding $2 for four copies shall be entitled to one copy gratis. tf

VERY IMPORTANT.—To persons owning a mill privilege on a small stream of water where they can obtain 24 feet or more fall, in a short distance—about 35 feet is preferred—the subscriber will furnish a motive power and fixtures which is acknowledged by all who have seen the operation not to be excelled. A specimen can be seen in the South East part of the town of Canaan, 6 miles from Falls Village, and in the South part of the town of Washington, Berkshire Co., Mass., 8 miles East of Lenox Court House, and in the Shaker Village of New Lebanon, Columbia, Co. N. Y. It is simple in its construction and very permanent and durable. It is peculiarly convenient for a common sawmill. I commonly use about 12 square inches of water for a sawmill and make it saw 100 feet of boards in ten minutes.

For further particulars enquire at the office of the Litchfield Enquirer, by letter to the subscriber directed to Falls Village, Litchfield County Conn. or to Daniel Copley New Lebanon, Columbia Co., N. Y. I have also a very important improvement for the Sawframe and the pitman irons, which I warrant to excel all others.

☞ The very best of reference and information will be given on request by letter or otherwise. All letters must be post paid.

4*22 HENRY WIGHTMAN.

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The Editors are so situated as to have access to all the scientific publications of America. Great Britain, France, and Germany; and have also received for the present volume, the approbation as well as the counsel and personal contributions of many of the ablest scientific men in this country, among whom are Profs. Agassiz, Horsford, and Wyman, of Harvard University.

As the work is not intended for scientific men exclusively, but to meet the wants of the general reader, it has been the aim of the editors that the articles be brief and intelligible to all.

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51 6ms 107 Fulton street, New York.

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m12 tf Patent Journal Office.

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Scientific Museum.

For the Scientific American.

Tanning--Practical Remarks.

Messrs. Editors—In your paper of the 12th January, you gave an account of a method of tanning, from the work of J. Burbridge, Esq., 1825. This is an age of progress, and very important improvements have been made in this article of Leather since that period; so that the method he has laid down, would be considered obsolete, in this country, at least at the present time. The business has increased beyond all precedent, and the quality of the sole leather turned out is very much improved also.

The tanneries erected in these days are from 2 to 500 feet long, 30 to 40 feet wide, and generally two stories high, the lower story filled up with vats, 8 feet by 7 on the surface, and 5 feet deep, except at one end, is placed the beam-house, where the hides are prepared for the bark; by softening them to a natural state, as near as possible to the living nature; with a removal of all the hair and flesh appertaining to them. The old method of softening dry hides was after soaking them in water sufficiently; to place them in a circular trough of solid materials, and roll over them a heavy circular stone, 4 or 5 feet in diameter, with notches worked into the face of the rim, drawn by a horse—after the method of our forefathers crushing apples to make cider. As early as 1810 the Hide Mill, something like a fulling-mill, was introduced, with sundry other improvements, by Col. William Edwards, then of Northampton, Mass., (of which I may speak more particularly hereafter.) About the year 1830 the cold sweating process was reduced to system by Thomas Hunt, of western New York, to remove the hair from the hides, which is now almost universally adopted by the trade. It is a simple operation of nature, which every dog who buried a woodchuck till the hair started, seemed to have known; but which, like many other improvements, man was slow to discover. Pits are constructed of solid materials (stone or brick are doubtless the best) in the ground, convenient to the beam-house, but should be so far from it as not to be affected by its temperature. They are 10 feet wide, 12 feet long and 10 feet deep to the roof, which should be like ordinary roofs of buildings above ground, rising from the sides to the centre, on an angle of 45 degrees, covered with plank two inches thick, laid close together. An opening in the apex, two inches wide, leading to the surface of the ground. This roof must be covered with earth, at least six feet deep.—Most of the large tanneries have six of these pits arranged on the sides of an alley, six feet wide, covered with flat timbers and earth, which leads from the floor of the beam-house. Each pit has a door four feet wide, opening into the alley, and underneath the alley should be a trunk of plank to conduct fresh air from the wheel-pit in the beam-house to the centre of each sweat-pit, where there is an opening closed at pleasure. By attending to this opening, and the one in the apex, the operator can regulate the temperature of the sweat pits.

We shall continue an account of the process in a future number. W. W. E.

Coal Gas Charcoal.

In the manufacture of coal gas a very singular form of charcoal is deposited in the retorts, and in the tubes connected with them, resulting from the decomposition of the first products of the distillation of coal. It has a grey colour, and often exhibits a laminated texture; and it breaks with an earthy fracture. It sometimes happens that the gas escapes through some crack in the retort, in which case, a pecular carbonaceous deposite forms upon the surrounding brickwork, of a stalactitic character an iron grey colour, and considerble lustre; it does not easily burn, nor does it soil the fingers, and some specimens, as far as mere appearance goes, might be considered as metallic. Some years ago Mr. Charles Macintosh, of Glasgow, made steel by passing coal gas over ignited iron, placed in an air-tight iron chest: in this process much carbon was deposited in various states, but some of it assnmed the remarkable form of capillary filaments, and tufts of a metallic lustre; the same tufts are frequently found in considerable quantities amongst the coke manufactured under Mr. Church's patent; they are very difficult of combustion, but when deflagrated with nitre, yield no trace of iron, and are, apparently, pure carbon. All these forms of carbon are excellent conductors of electricity, and when sawed into plates, serve admirably instead of platinum for a galvanic arrangment.

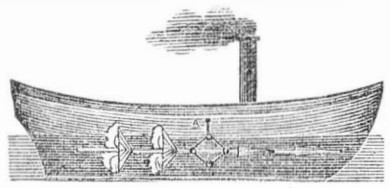
History of Propellers and Steam Navigation.

[Continued from page 176.]

SIDE FAN PROPELLER.

Various plans have been proposed from time to time, to propel by a kind of propeller that would close when moving forward against the water, to offer at least but little resistance to it, and would open when moving backward to act with great surface and power on the water. The Duck foot Propeller, of the Earl Stanhope, was devised to act on this principle, which really has something very plausible and self-commending in it. As practical experiment, however, is the real test of any invention—the touchstone of its economical value—so in the case of the duck-foot paddle, it was "weighed in the balance and found wanting."

Fig. 23.



The invention represented in this engraving was invented about twenty years ago, and it was the result of observing the powerful action of the "tail of a fish." The piston of the engine being attached to the rod, A, will alternately open and shut a series of sliding submarine fans, which may be variously constructed, and placed without the sides or bow, or stern of a vessel, keeping up a constant pressure upon the water, and a consequent motion upon the vessel forward, without backwater or splashing. Hinged paddles attached to a reciprocating frame, so as to fold upwards, and assume a horizontal position when moving forwards, and to have their flat full surfaces acting upon the water, when moving backwards, have been brought forward oftentimes since the above was brought forward. About two years ago, only, the same thing was brought forward in this city, and high hopes were entertained about it, but it now reposes in oblivion.

It is something very annoying to the man accustomed to scientific research, to find the same things invented over and over again by different individuals, living in different places. Within three years the duck-foot propeller has appeared in public print, as something new, because somewhat modified from the original one, in contour and arrangement. In the London Mechanics Magazine, for 1845, there are two engravings of plans for propelling, by applying the direct action of the piston rod to move a fan piston to act upon the water at the stern of a vessel, and close when moving forward, so as to propel the vessel upon the same principle as that represented above. There can be no question of its simplicity, but simplicity, although desirable, is not always possible to accomplish certain objects, but the most simple way to do a certain thing, is certainly the best. Every thing must be judged by its effects—its whole effects.

An English Savan recently lecturing before a learned society in London, on the gold of California gave it as his opinion, that platina, garnets, and diamonds were overlooked in a very great degree by the gold finders, and that they would be found in large quantities. He also stated that tons of gold had passed through the hands of a single English house.

The whole number of flouring mills in operation in Michigan during the last year, was 228, having 508 run of stone, turning out 719,478 barrels of flour, giving employment to 598 hands, with an investment of capital amounting to $1,496,400.

The Telescope.

The interesting and humbling views of the absolute and relative extent of the solar and sidereal systems, we owe entirely to the Telescope,—an instrument which has a higher claim to our admiration than it has received, and which, by the improvements of which it is susceptible, will present in Astronomy much grander discoveries than the most sanguine of its students has ventured to imagine or anticipate. There is, indeed, no instrument or machine of human invention, so recondite in its theory and so starling in its results. All others embody ideas and principles with which we are familiar, and however complex their construction, or vast their power, or valuable their products, they are all limited in their application to terrestial and sublunary purposes. The mighty steam engine has its germ in the simple boiler in which the peasant prepares his food. The huge ship is but the expansion of the floating leaf, freighted with its cargo of atmospheric dust; and the flying balloon is but the infant's soap bubble lightly laden and overgrown. But the Telescope, even in its elementary form, embodies a novel and gigantic idea, without an analogue in nature and without a prototype in experience. It enables us to see what would forever be invisible. It displays to us the being and nature of bodies which we can neither see, nor taste, nor touch, nor smell. It exhibits forms, and combinations of matter, whose final cause reason fails to discover, and whose very existence even the wildest imagination never ventured to conceive. Like all other instruments it is applicable to terrestrial purposes; but unlike them all, it has its noblest application to the grandest and remotest works of creation.

The Telescope, says the North British Review, was never invented. A Dutch spectacle maker stumbled upon it, when accident threw two of his lenses into an influential position. It was a divine gift, which God gave to man in the last era of his cycle, to place before him and beside him new worlds and systems of worlds, to foreshow the future sovereignties of his vast empire—the bright abode of disembodied spirits and the final dwelling of saints that have suffered, and of sages that have been truly wise. With such evidences of his power, and such manifestation of his glory, can we disavow his Ambassador, disdain his message, or disobey his commands?

In looking back upon what the Telescope has accomplished—in reckoning the thousands of celestial bodies which have been detected and surveyed—in reflecting on the vast depths of either which have been sounded, and on the extensive fields of sidereal matter out of which worlds and systems of worlds are forming and to be formed—can we doubt it to be the Divine plan, that man shall yet discover the whole scheme of the visible universe, and that it is his individual duty, as well as the highest prerogative of his order, to expound its mysteries, and to develope laws? Over the invisible world he has received no commission to reign, and into its secrets he has no authority to pry. It is over the material and the visible that he has to sway the intellectual sceptre. It is among the structures of organic and inorganic life, that his functions of combination and analysis are to be chiefly exercised. Nor is this a task unworthy of his genius or unconnected with his destiny. Placed upon a globe already formed, and constituting part of a system already complete, he can scarcely trace either in the solid masses around him, or in the forms and movements of the planets, any of those secondary causes by which these bodies have been shaped and launched on their journey. But in the distant heavens, where creation seems to be ever active, where vast distance gives us the vision of huge magnitudes, and where extended operations are actually going on, we may study the cosmogony of our system, and mark, even during the brief space of human life, the formation of a planet in the consolidation of the nebulous rays that surround it. Such is the knowledge which man has yet to acquire; such the lesson which he has to teach his species. How much to be prized is the intellectual faculty by which such a work is to be performed. How wonderful the process by which the human brain, in its casket of bone, can alone establish such remote and transcendental truths. A soul so capacious, and ordained for such an enterprise, cannot be otherwise than immortal.

LITERARY NOTICES.

Holden's Dollar Magazine, for March has made its appearance, well illustrated and filled with a choice combination of original matter. Taken altogether this is one of the most sterling publications ever offered for public patronage, and the very small price for which it is furnished per year, makes it an inducement for all to become patrons. Every article evinces the sound judgment and discrimination of its enterprising publisher. Terms, $1 per year.

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Specimens of the Stone, Iron, and Wood Bridges, Viaducts, &c., of the United States, Rail Roads, &c. By George Duggan, Arch't and C. E. Part 2, containing the conclusion of the article on the "Utica and Syracuse R. R.," and plans, elevations, &c., of the celebrated Cascade bridge, near Lanesboro', on the N. Y. and Erie R. R., and plans, sections, elevations, &c., of bridges of 120 and 173 feet span over the Chicopee River, near Willimansett, on the Connecticut River Rail Road, is now ready. N.B. As this work is publishing by subscription, those wishing to possess it should lose no time in forwarding their names, with a remittance of $5, to Munn & Co. at the office of the Scientific American, who will forward it regularly each month as published to subscribers.

Banker's Magazine for February. Boston: J. Smith Homans, publisher, No. 111 Washington street. This valuable work contains papers of great interest to all business men, and should receive a large patronage. The essays on Exchange are worth the whole subscription price.

Minifie's Drawing Book.—The first edition of this great work was disposed of in a short time, and the second is now ready, for sale at this office. The author has improved its appearance very much, while the matter stands far above any similar work ever published. Price $3.

"Philip Moreton, the Poor Gunsmith, or Circumstantial Evidence," by Frank Worthington. This very entertaining work is published in Boston, by R. B. Fitts & Co., 22 School-st., and for sale by booksellers generally.

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